Message

From: Lindstrom, Andrew [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=04BF7CF26AA44CE29763FBC1C1B2338E-LINDSTROM, ANDREW]
Sent: 6/8/2016 6:16:36 PM
To: Victoria Sacks [victoria@greensciencepolicy.org]; Lau, Chris [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd4494e8927a4d78a5d2b9b20c618d4e-Lau, Chris]
CC: Arlene Blum [arlene@arleneblum.com]
Subject: RE: Fluorinated Chemicals and GSP
Attachments: Dewitt_book.pdf; Commentary__Class_Action_Lawsuits__Can_They.3.pdf; Sir Austin Bradford Hill 1965.pdf; draftsystematicreviewimmunotoxicityassociatedpfoa_pfos_508.pdf; Grandjean&Clapp-2015-New Solut-PFAS.pdf; PFOA Health Advisory Final.pdf; PFOS Health Advisory Final.pdf; drinkingwaterhealthadvisories_pfoa_pfos_5_19_16.final_.1.pdf

Victoria,

I am happy to try to help answer your questions.

First off, I'm not sure what you mean by "evidence-based research." All research is going to have conclusions that are based on the evidence gathered during the experimental phase of the work. The degree of confidence one would have in the conclusions would be based on the weight of the evidence.

I think that determining a causal link between PFAS and disease is only really possible in animal studies at this time. We can separate groups of mice into treated and control groups, and given enough numbers, you can conclusively demonstrate health effects at different dosing levels. Chris will be able to give you lots of data on specific health effects that have been identified in animal studies. (It's probably time for him to write another review anyway). In the meantime, please check out Chris's chapter in the Jamie Dewitt's book that I've attached above – this might be the most current summary of knowledge on the PFAS right now. There's lots of good stuff in there making a case for animal toxicity.

For humans I think you're going to have to rely on associations found in epidemiological studies. You can't do human dosing experiments, but you can find "natural experiments" like, for example, where everybody in Parkersburg is exposed to elevated levels of PFOA.

Please check out the C8 Science Panel site here:

http://www.c8sciencepanel.org/prob_link.html

This covers the largest group of epidemiological studies on one PFAS (PFOA) and does a great job of describing the "links" between exposure and disease.

I've also attached a short summary paper above that ties all of their findings together (Commentary Class Action Law Suits) in one short document. The epidemiologists that wrote this piece and conducted this research using the classic Bradford Hill criteria (Sir Austin Bradford Hill 1965, attached above) to guide their study design and interpret their work. Because this was done in the context of a lawsuit for a specific class of exposed individuals, the court ordered them to simply determine whether it was more likely than not that PFOA exposure resulted in disease. If you take the time to read the papers listed on the webpage, you will see that they were using the Bradford Hill criteria to establish a case for causality – or in this case, a probable link.

Another relevant study was just released here:

http://ntp.niehs.nih.gov/about/org/monopeerrvw/meetings/index.html

The National Toxicology Program has concluded that both PFOA and PFOS are presumed to be immunotoxic in humans (summary attached above). This is a very big deal because some researchers have called for drinking water restrictions down to about 1 ng/L for PFAS based on possible immunotoxic effects in children and vulnerable adults (Grandjean & Clapp 2015, attached above).

I've also attached some of the EPA's documentation concerning the recently announced Health Advisories for PFAS in drinking water. This may be helpful in defining reasons for concern with exposure.

I am also very happy to see that you are also interested in EJ issues related to the PFAS. I think Chris is right that some studies have suggested that PFAS exposure positively is related to income or class, but I also absolutely believe there is a very big and almost completely unexamined EJ dimension here as well. Working closely with the UCMR3 data (https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule) it has become pretty clear to me that large fluorochemical manufacturing facilities and smaller PFAS using companies have been built in poor communities with few environmental controls. I'm thinking about Decatur, Alabama and Parkersburg, West Virginia, and the small towns next to many military fire training facilities. We'd need a real EJ person (maybe from Steve Wing's group at UNC or Phil Brown's group at Northeastern) to help us make a scientific assessment of this hypothesis. I've been talking with Courtney Carignan (and Lara Schaider and Arlene) about the possibility of writing a paper that specifically addresses this important issue.

Please let me know if I can help in any way.

Thank you very much,

Andy

From: Victoria Sacks [mailto:victoria@greensciencepolicy.org]
Sent: Tuesday, June 07, 2016 6:12 PM
To: Lau, Chris <Lau.Christopher@epa.gov>; Lindstrom, Andrew <Lindstrom.Andrew@epa.gov>
Subject: Fluorinated Chemicals and GSP

Dear Chris and Andy

I have recently joined GSP and am working with Arlene on a policy statement for the American Public Health Association on PFAS. I am new to these chemicals and would very much appreciate your insights and/or answers into questions as below:

1. Are there papers with evidence-based research done showing causality rather than just association between PFASs and adverse health effects?

2. Are there studies on environmental justice relating to fluorochemicals? For example, individuals who are economically disadvantaged may be more likely to live near municipal wastewater or be exposed to air pollution, household dust, or contaminated soils/groundwater. Which papers do you suggest if so?

Thank you very much,

Victoria

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